4. CLAIMS

1. An aqueous solution comprising an azo dye, a borate buffer and one or more masking agents, wherein the azo dye changes its coloration or coloration intensity in the presence of chlorine dioxide.

2. The aqueous solution according to claim 1, wherein the azo dye is amaranth or Evans blue.

3. The aqueous solution according to claim 1, wherein the azo dye is present at a concentration of between about 1×10^{-6} and about 1×10^{-3} mol/liter.

4. The aqueous solution according to claim 1, wherein the azo dye is present at a concentration of between about 2×10^{-5} and about 8×10^{-4} mol/liter

5. The aqueous solution according to claim 1, wherein the masking agent is aqueous ammonia.

6. The aqueous solution according to claim 1, wherein the borate is present at a concentration of between about 5×10^{-3} and about 1×10^{-1} mol/liter.

7. The aqueous solution according to claim 1, further comprising one or more metal-chelating agents.

8. The aqueous solution according to claim 7, wherein the metal-chelating agent is a sodium salt of EDTA.

9. The aqueous solution according to claim 8, wherein the sodium salt of EDTA is present at a concentration of between about 0.5 and about 2 g/liter.

10. The aqueous solution according to claim 9, wherein the aqueous solution contains about 5×10^{-2} mol/l of borate, about 1.5×10^{-2} mol/l of aqueous ammonia as the masking agent, about 1 g/l of sodium salt of EDTA and about 2×10^{-4} mol/l of amaranth as the azo dye.

~~11. The aqueous solution according to claim 9, wherein the aqueous solution contains about 5×10^{-2} mol/l of borate, about 1.5×10^{-2} mol/l of aqueous ammonia as the masking agent, about 1 g/l of sodium salt of EDTA and about 5×10^{-4} mol/l of Evans blue as the azo dye.~~

12. A process for manufacturing the aqueous solution according to one of claims 1 through 11, comprising the steps of:

(a) introducing the azo dye, the masking agent(s) and the borate buffer solution into a container containing a sufficient amount of double-deionized water;

(b) optionally adding the chelating agent predissolved in double-deionized water with stirring; and

(c) making up the solution to a desired volume with double-deionized water.

13. The process according to claim 12 further comprising the steps of:

(i) dissolving the azo dye in double-deionized water;

(ii) introducing into a container the solution prepared in (i), followed by a borate buffer solution, and finally a solution containing one or more masking agents;

(iii) adding double-deionized water and measuring pH;

(iv) adjusting pH to about 9.2, if necessary, using concentrated aqueous ammonia solution;

(v) optionally adding the chelating agent with stirring; and

(vi) making up the solution to a desired volume with double-deionized water.

14. The process according to claim 13, wherein the concentrated aqueous ammonia solution at about 28% (w/w) is used in the step (ii) as a masking agent and in the step (iv).

15. The process according to claim 14 further comprising the steps of:

(i) dissolving either about 121.2 mg of amaranth [Ref. A-1016(97) Sigma] or about 56.5 mg of Evans blue (Ref. 20,633-4, Aldrich) in about 100 ml of double-deionized water;

(ii) dissolving about 3.09 g of boric acid in 500 ml of 0.1 M KCl solution and mixing it to homogeneity to prepare about 5 x 10^{-2} M borate buffer;

(iii) successively introducing into a one-liter flask, the amaranth or Evans blue solution prepared in (i), the borate buffer solution prepared in (ii), and about 1 ml of about 28% (w/w) aqueous ammonia solution;

(iv) adding double-deionized water and measuring pH;

(v) adjusting pH to about 9.2 using about 28% (w/w) aqueous ammonia solution;

(vi) adding about 1 g of sodium salt of EDTA with stirring until it completely dissolves; and

(vii) transferring the solution prepared in (vi) into a 1000-ml graduated flask and making up the total volume to the graduation mark with double-deionized water.

16. A process for determining a residual chlorine dioxide content in industrial water or drinking water after treatment or in distribution circuits, comprising the steps of:

placing the water to be analyzed in contact with the aqueous solution prepared by the process according to claim 12; and

measuring an absorbance of the resultant solution using a UV-visible spectrophotometer at a specific wavelength of the azo dye chosen.

17. The process according to claim 16, wherein a volume ratio:

the water to be analyzed/the aqueous solution

is between about 10 and about 30.

~~18. A process for determining a residual chlorine dioxide content in industrial water or drinking water after treatment or in distribution circuits, comprising the steps of:~~

~~placing the water to be analyzed in contact with an aqueous solution prepared by the process according to claim 12, wherein a volume ratio:~~

~~the water to be analyzed/the aqueous solution~~

is between about 10 and about 30; and

measuring an absorbance of the resultant solution using a UV-visible spectrophotometer at a specific wavelength of the azo dye chosen.

19. The process according to claim 18, wherein

about 10 ml of the aqueous solution are placed into a 250-ml graduated flask and made up to the graduation mark with the water to be analyzed; and

an absorbance of the resultant solution is measured using a UV-visible spectrophotometer at 521 nm for amaranth or at 606 nm for Evans blue.

20. The process according to claim 19, wherein an absorbance is measured using, as a reference, the water to be analyzed to which purified and crystallized sodium thiosulphate has been added in excess of the amount required to reduce any oxidizing agents present in the water.